Cortical plasticity induced by inhibitory neuron transplantation.

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Public Summary:

Scientific Abstract:
Critical periods are times of pronounced brain plasticity. During a critical period in the postnatal development of the visual cortex, the occlusion of one eye triggers a rapid reorganization of neuronal responses, a process known as ocular dominance plasticity. We have shown that the transplantation of inhibitory neurons induces ocular dominance plasticity after the critical period. Transplanted inhibitory neurons receive excitatory synapses, make inhibitory synapses onto host cortical neurons, and promote plasticity when they reach a cellular age equivalent to that of endogenous inhibitory neurons during the normal critical period. These findings suggest that ocular dominance plasticity is regulated by the execution of a maturational program intrinsic to inhibitory neurons. By inducing plasticity, inhibitory neuron transplantation may facilitate brain repair.